

PIN - Productivity Projects Fund

Small Responsive Project Report

Mapping the Cognitive Landscape of Productivity in Northern Ireland: A Systems Approach to Understanding Productivity Policy

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About PIN

The Productivity Insights Network was established in January 2018 and is funded by the Economic and Social Research Council. As a multi-disciplinary network of social science researchers engaged with public, private, and third sector partners, our aim is to change the tone of the productivity debate in theory and practice. It is led by the University of Sheffield, with co-investigators at Cambridge Econometrics, Cardiff University, Durham University, University of Sunderland, SQW, University of Cambridge, University of Essex, University of Glasgow, University of Leeds and University of Stirling. The support of the funder is acknowledged. The views expressed in this report are those of the authors and do not necessarily represent those of the funders.

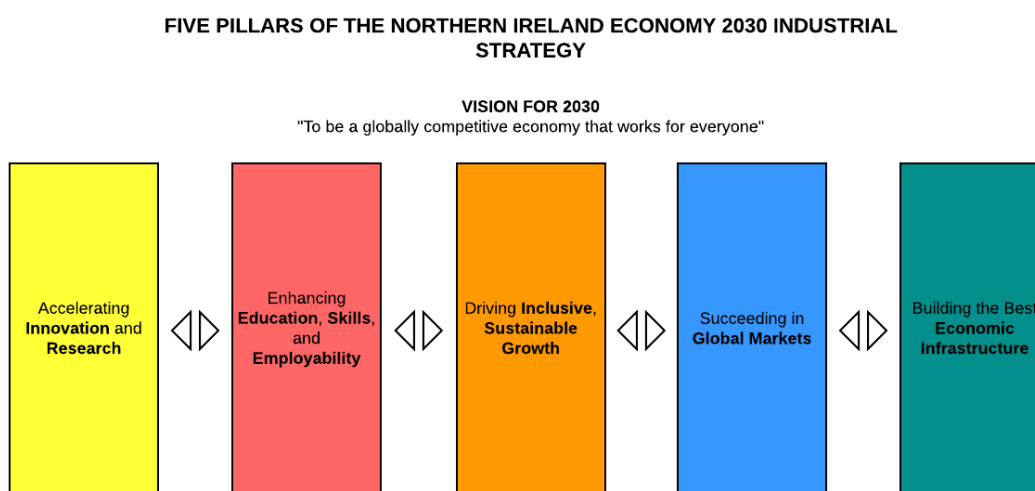
Executive summary

Context

Productivity is a core concept in economics and a key determinant of economic prosperity. It measures how effectively resources and factors are utilised in the production of goods and services, including all of the interactions with, and roles played by, the market, technological, institutional and cultural setting. Boosting productivity has become a policy objective across most developed economies and is central to the UK Industrial Strategy. Northern Ireland regularly lags UK averages on productivity performance and has also experienced stagnating productivity growth rates.

Despite being central to both UK and Northern Ireland public policy, to date interventions have had little effect on productivity outcomes. We argue that developing policies to effectively influence productivity outcomes requires the kind of broad and multidimensional approaches advocated by both industrial strategies. However, we suggest that an institutional bias towards thinking in terms of policy silos has prevented policy makers from identifying and acting upon opportunities for joined-up policy design and governance. Instead, we argue that the productivity puzzle may be more effectively addressed by conceptualising using a systems approach in which the economy, and policy space, is conceptualised as a *system* whose functioning, interactions, and interdependencies should be understood as a whole as part of the policy process. This project was an exploratory attempt to apply a systems perspective in the context of Northern Ireland productivity policy to generate a map of how policy makers perceive the economic system. **Through this process we highlight gaps, biases, and potential opportunities for developing a more refined model of the system to underpin future policy interventions.**

Figure 1: Five pillars of the Northern Ireland 2030 industrial strategy



The rationale for a systems approach

Systems approaches focus on mapping and explaining systems or processes characterised by complexity – in other words systems that lack order and stability and universal laws. These approaches have been applied in public policy to understand and address complex or “wicked” problems.

Complex systems, such as those that characterize policy environment around productivity have several characteristics.

- **Interdependence:** A complex system cannot be explained merely by breaking it down into its component parts because those parts are *interdependent*: elements interact with each other, share information and combine to produce systematic behaviour.
- **Non-linear dynamics:** Behaviour in systems is difficult to predict and exhibit ‘*non-linear*’ dynamics produced by feedback loops. *Small actions can have large effects and large actions can have small effects.*
- **Path dependence:** Complex systems are particularly sensitive to initial conditions which produce a long-term momentum or ‘path dependence’.
- **Emergence:** They exhibit emergence, or behaviour that evolves from the interaction between elements at the local level rather than central direction. *This makes the system difficult to control.*
- **Strange attractors:** They may contain ‘strange attractors’ or demonstrate extended regularities of behaviour which are ‘liable to change radically’ and may therefore *exhibit periods of ‘punctuated equilibria’* - in which long periods of stability are interrupted by short bursts of change.
- **Interdisciplinarity:** The various problems that complexity theory seeks to address *can only be served by interdisciplinary scientific groups* (Mitchell, 2009: x).

Policy to date has treated productivity as a complicated problem often addressed in silos instead of one characterized by complexity that requires a coordinated and adaptive approach. Adopting a systems approach understanding productivity could help illuminate missed opportunities and negative policy interactions.

Applying systems to productivity in Northern Ireland

Cognitive maps of how actors perceive the system can help us better understand potential interactions, interdependencies, and feedback loops. We analyse the relationship between elements of the economy by exploring how concepts are connected across thematic areas in three data sources:

- **Economy 2030 Industrial Strategy:** The Industrial Strategy provides a snapshot of how policy makers perceive the economic system.
- **Industrial Strategy Evidence Base:** Is a repository of 100 documents compiled to inform the development of the Industrial Strategy. Looking at how concepts are connected in the evidence base functions as a control and helps us map how the system is perceived in the literature.
- **Participatory mapping workshops:** We also engaged in a process of participatory mapping with stakeholders to provide a more current understanding of the contours of the system.

Comparing the three maps that resulted from these analyses enabled us to highlight biases, illuminate potential areas for policy synergies, and provides directions for future research.

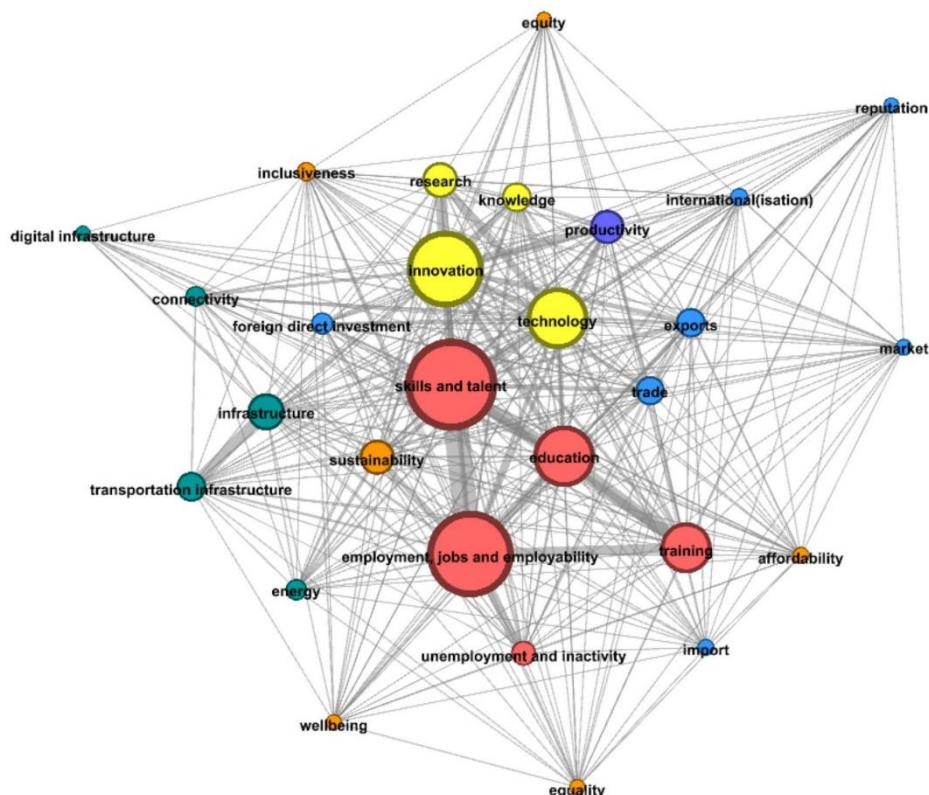
Findings

Despite being highly structured around thematic, although interdependent and mutually supportive, silos we find strong evidence of conceptual linkages across Pillars in the Economy 2030 document. This is evidence that the policy makers that framed the document have a cognitive map of the Northern Ireland economy that frequently links up *concepts* across policy silos even if in *practice* policies are then implemented separately. Differences between the Economy 2030 map and the evidence base and stakeholder results point to areas that might be usefully developed in future industrial strategies. A key next step from this analysis will be to figure out where and how to adopt these findings about areas of potential policy interdependencies and interaction into policy practice.

Table 1: Potential areas of policy synergy - Most linked pairs across Pillar boundaries in the evidence base

Concept 1	Concept 2	Links	↕
skills and talent	technology	332	
skills and talent	innovation	318	
technology	research	302	
productivity	innovation	301	
education	innovation	220	
sustainability	employment, jobs and employability	188	
employment, jobs and employability	innovation	187	
education	technology	182	
productivity	technology	175	
exports	innovation	169	
employment, jobs and employability	technology	141	
skills and talent	knowledge	129	
productivity	employment, jobs and employability	117	
energy	sustainability	106	
training	innovation	99	
sustainability	skills and talent	98	
connectivity	innovation	97	
trade	innovation	93	
exports	skills and talent	89	
infrastructure	technology	85	
infrastructure	innovation	77	
foreign direct investment	skills and talent	72	
connectivity	technology	69	
infrastructure	employment, jobs and employability	69	
productivity	skills and talent	64	
sustainability	education	60	
trade	employment, jobs and employability	60	
transportation infrastructure	employment, jobs and employability	58	
sustainability	research	55	

Figure 2: Cognitive map generated from the evidence base



Some other key findings include:

- **Jobs and education are central:** Themes related to Education, Skills, and Employability tend to dominate all of the maps suggesting that it is likely a major cross-cutting theme and confirms the perceived importance of these concepts within the economic system.
- **Infrastructure is overlooked:** Infrastructure appears more prominently in the evidence base and the stakeholder maps and may, therefore, represent an important cross-cutting theme that is being overlooked in the current Industrial Strategy.
- **Productivity is more prominent in literature than in practice:** Productivity was most frequently connected and discussed in the evidence base, which might indicate that its significance is not being effectively translated from theory (literature) to stakeholder experience and policy practice and that it may be merely a policy buzzword under current arrangements. While the Economy 2030 document itself was structured around competitiveness productivity was cited as a key performance indicator but was directly engaged with less frequently than the trends identified in the evidence base would suggest.
- **We should look for policy synergies where there are strong conceptual links across Pillar boundaries:** Table X depicts the most highly connected concepts in the evidence base, which represent the potentially most fruitful places to consider

incorporating into joined up policy. The most highly connected pairs are visible in Figure 2 where lines linking the nodes are thickest.

Implications

These findings suggest several important implications for productivity policy and research. The following observations may be useful in any refresh of the Industrial Strategy with the return of Government in Northern Ireland in 2020. An important aspect of adopting a systems perspective is the need for decision makers to recognise that setting a clear policy position may require difficult choices and the willingness to get things wrong, interpret policy feedback, and adapt accordingly in accordance with experimental principles.

- Productivity is a challenging concept that needs to be clearly articulated and socialized to be effective:** While the Economy 2030 document, was explicitly structured around competitiveness it explicitly describes productivity as an indicator of its long-term competitive performance. These findings show that the document engaged with this key indicator far less than expected and it came up only rarely in the stakeholder workshops. This may be because it is poorly defined, poorly understood, difficult to engage with, or seen as less (politically) important than other (more mainstream?) factors. While productivity is obviously affected by a wide variety of policies regardless of whether stakeholders care to discuss the concept or not, and regardless of whether it is central to policy agendas, if the lack of clear definition and lack of policy centrality that we observed in the course of this study has been a long term feature of economic policy in Northern Ireland (and indeed possibly the UK) then it is no surprise that a variety of uncoordinated policies have been unable to meaningfully move the productivity needle.
- Productivity policy should engage more with productivity:** The current Industrial Strategy cites productivity as a key long-term indicator of Northern Ireland's competitive position, and one of its stated objectives is to accelerate the pace of productivity improvements. However, an analysis of the document indicates that productivity is not frequently mentioned relative to other concepts, such as jobs and education, and it is not as well-connected or central as many other concepts. This suggests that the productivity is not the most important focus of the current Industrial Strategy. If Government intends for productivity to be a central policy focus, then strategy documents need to more effectively explore the factors that influence productivity growth and engage with them in a holistic and meaningful way across policy silos.
- Adopting a systems approach to policy design requires joined up strategy, policy design, implementation, and evaluation:** There is no one size fits all approach to adopting a systems lens to public policy but there are some general phases that can guide the process. First, understanding the contours of the system is a crucial initial step. Exercises such as this research project can lay the foundations for this process, but it should ultimately be complemented by broader participatory mapping and strategy sessions that aim to explore and prioritize areas for intervention and where joined up governance has the potential to make an impact. This collaboration should include representatives across departments and, if possible, stakeholders from across sectors of the economy and should be institutionalized in the strategy development and then in the translation of that strategy into policy interventions (ideally adapting experimental approaches). Finally, policy evaluation should also engage a broad base of participants who collaboratively design criteria, interpret policy feedback, and formulate policy adjustments.